

WHAT IS CLAIMED IS:

1. A vertical refuse incinerator for incinerating industrial wastes, including medical wastes, and general wastes, comprising:

5           an incinerator body having a funnel-shaped lower side wall, a flame zone, a refuse layer, a glow layer and an ash layer being formed in this order inside the incinerator body from top to bottom at the time of combustion;

          an exhaust gas mixing device for spinning combustion gas that is made of a refractory, that is provided above the incinerator body and that has  
10       a plurality of secondary air blow holes for supplying secondary air for re-combustion formed therein, at least a part of the air blow holes being opened toward the flame zone in an upper portion of the incinerator body;

          a re-combustion chamber placed on the exhaust gas mixing device;

          a cooling casing covering the exterior of the funnel-shaped side wall;

15       a plurality of primary air nozzles supplying primary air for combustion that are introduced into the incinerator body;

          a casing that is provided for the ash layer below the incinerator body and that houses retractable refuse supporting means and a closable bottom ash discharge plate disposed below the refuse supporting means with a  
20       clearance interposed between the refuse supporting means and the bottom ash discharge plate; and

          an air duct supplying air for final burning that is incorporated into the casing,

          wherein, at the time of discharging bottom ash, the refuse supporting  
25       means is projected into the ash layer so as to support the load of refuse and bottom ash deposited in the incinerator body, then the closed bottom ash discharge plate is opened so as to discharge the bottom ash retained between

the refuse supporting means and the bottom ash discharge plate, followed by closing the bottom ash discharge plate, and then the refuse supporting means are retracted.

5     2. The vertical refuse incinerator according to claim 1,

          wherein the refuse supporting means comprises a supporting means body formed by arranging side by side a plurality of supporting rods in a fitting frame or two of said supporting means bodies in which said supporting means bodies are placed facing each other such that the supporting rods are  
10    opposed to one another;

          wherein cooling means for cooling the supporting means body or bodies with a cooling fluid and an external driver for retractably driving the supporting means body or bodies are provided; and

          wherein the external driver is provided with a supporting means  
15    detector comprising pressure detection means and position detection means.

3. A vertical refuse incinerator for incinerating industrial wastes, including medical wastes, and general wastes, comprising:

          an incinerator body having a funnel-shaped lower side wall, a flame  
20    zone, a refuse layer, a glow layer and an ash layer being formed in this order inside the incinerator body from top to bottom at the time of combustion;

          an exhaust gas mixing device for spinning combustion gas that is made of a refractory, that is provided above the incinerator body and that has a plurality of secondary air blow holes for supplying secondary air for  
25    re-combustion formed therein, at least a part of the air blow holes being opened toward the flame zone in an upper portion of the incinerator body;

          a re-combustion chamber placed on the exhaust gas mixing device;

a cooling casing covering the exterior of the funnel-shaped side wall;  
a plurality of primary air nozzles supplying primary air for  
combustion that are introduced into the incinerator body;

a casing that is provided for the ash layer below the incinerator body  
5 and that houses an inclined reversible grate that can be reversed from a  
horizontal position in which bottom ash is deposited and retained to a vertical  
position in which bottom ash is discharged; and  
an air duct supplying air for final burning that is incorporated into  
the casing.

10

4. The vertical refuse incinerator according to claim 1, 2 or 3,  
wherein sludge drying means are provided in the incinerator body or  
in an upper portion of the re-combustion chamber.

15 5. The vertical refuse incinerator according to any one of claims 1 to 4,  
wherein refuse charging equipment for charging refuse to the  
incinerator body is provided and the refuse charging equipment is provided  
with a space for drying and preheating refuse.

20 6. The vertical refuse incinerator according to any one of claims 1 to 5,  
further comprising:

a combustion control device for controlling, in accordance with the  
change in the temperature in the incinerator, an amount of supply of the  
secondary air, the final burning air, incinerator temperature cooling water  
25 and refuse, as well as temperature of an air pre-heater after completion of a  
combustion operation;

a bottom ash discharge control device for operating the bottom ash

discharge device under the condition that a temperature of the ash layer has decreased to a set value or lower after a set time has elapsed; and

a dioxin-reducing device for completing re-combustion of exhaust gas by controlling the amount of air supplied from the secondary air blow holes formed in the exhaust gas mixing device, in such a manner that an average value of the concentration of carbon monoxide in the exhaust gas is not greater than a set value.

7. A method for controlling the vertical refuse incinerator according to claim 2, 4, 5 or 6,

wherein a discharge area temperature detector is provided in a discharge area located between the refuse supporting means and the bottom ash discharge plate, and, when a value detected by the discharge area temperature detector is greater than a set value, an alarm is generated and an opening operation of the bottom ash discharge plate is stopped, while retracting the refuse supporting means; and

wherein a supporting means detector is provided in the discharge area, and, when the supporting means detector detects that a resistance of the ash layer is greater than a predetermined value at the time of projecting the refuse supporting means, or that a projecting step of the refuse supporting means is not completed, a cooling fluid is jetted into the ash layer so as to break up a clinker.